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*ERDC Leadership Development Program*

## **The Madness behind the Method**

Showing the Human Side of Developing a World-Class Institution

Emily B. Moynihan, Candice B. Mitchell, Reena Patel,  
Marrissa Anderson, and David Schweitzer

March 2024

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Emily B. Moynihan, Candice B. Mitchell, Reena Patel, Marrissa Anderson,  
and David Schweitzer

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## Abstract

The 2022–2023 Leadership Development Program 2 (LDP2) team from the Information Technology Laboratory (ITL) created this document to explore the human side of ITL’s history through the viewpoints of former influential figures at the lab. These individuals played a crucial role in elevating the lab to its current prominent position. The dynamic nature of the document allows continuous addition of such stories, providing to future generations insight into the unwavering commitment of the pioneers who established ITL’s esteemed legacy. Each narrative sheds light on different aspects of the lab, including its people, diversity, and excellence. The document serves as both a tribute to the lab’s achievements and a wellspring of inspiration for aspiring leaders, showcasing the profound impact of dedication and teamwork. By celebrating these stories, we are able to learn from those who came before us and cultivate an enhanced vision for the future.

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## Preface

This study was conducted for the US Army Engineer Research and Development Center–Information Technology Laboratory (ERDC-ITL) under funding account U4387774. The technical monitor was Mr. Kevin Winters.

The work was performed by the Information Science and Knowledge Management Branch (Ms. Molly McManus, chief) and the Cybersecurity Engineering and Analysis Branch (Ms. Kelly Hills, chief) of the Software Engineering and Informatics Division (Mr. Quincy Alexander, chief) and the Computational Analysis Branch (Mr. David Stuart, chief) of the Computational Science and Engineering Division (Dr. Jeffrey Hensley, chief), ERDC-ITL. The deputy director of ERDC-ITL was Dr. Jackie S. Pettway, and the director was Dr. David A. Horner.

COL Christian Patterson was commander of ERDC, and Dr. David W. Pittman was the director.

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# 1 Introduction

## 1.1 Background

In 1986, the Information Technology Laboratory (ITL) was established to consolidate US Army Waterways Experiment Station's (WES) Information Technology functions, including the Automated Data Processing Center, the Visual Production Center, and the WES Technical Library. Since then, ITL has grown to be a premier DoD laboratory with a mission to provide innovative solutions to solve the Nation's most complex and challenging information technology and computational issues.

## 1.2 Objectives

ITL produces world-renowned research, but it is rare that we get a glimpse of the passion and humor behind the science. This collection of short stories provides an opportunity to share tales about the founding and growth of ITL while also conveying the enthusiasm and perseverance displayed by those who came before us.

## 1.3 Approach

The final project is an integral segment of the curriculum for the US Army Engineer Research and Development Center (ERDC) Leadership Development Program 2 (LDP2). To satisfy the requirement for a final project, the 2022–2023 ITL LDP2 team created a compilation that explores the human side of the history of ITL through the viewpoints of retired influential figures:

- Dr. Fred Tracy, former ITL researcher (Section 2, as interviewed by Dr. Candice Mitchell)
- Dr. Reed Mosher, former ITL director (Section 3, as interviewed by Dr. Candice Mitchell)
- Dr. Jeffery Holland, former director of ITL and ERDC (Section 4, as interviewed by Dr. Candice Mitchell)
- Dr. Deborah Dent, former ITL deputy director (Section 5, as interviewed by Dr. David Schweitzer)
- Dr. Robert Welch, former ITL division chief (Section 6, as interviewed by Dr. Reena Patel)

- Dr. Louis Turcotte, former ITL researcher (Section 7, as interviewed by Ms. Emily Moynihan)
- Ms. Patti Duett, former ITL deputy director (Section 8, as interviewed by Dr. Reena Patel)
- Dr. Robert Whalin, former WES director (Section 9, as interviewed by Dr. David Schweitzer)
- Ms. Alice Duke, former ITL division chief and ERDC associate director (Section 10, as interviewed by Ms. Marrissa Anderson)

In addition to producing this collection of stories, our ITL LDP2 cohort hosted a live roundtable (with an option for virtual attendance), bringing in a group of these legends to speak to current team members (Figure 1).

**Figure 1. Dr. Fred Tracy, Dr. Deborah Dent, Dr. Jeffery Holland, Dr. Reed Mosher, and Dr. Robert Whalin speaking at a roundtable exploring the passion and humor of the early days of the Information Technology Laboratory (ITL).**



These individuals played a crucial role in elevating the lab to its current prominent position. Each narrative sheds light on different aspects of the lab, including its people, diversity, and excellence. This shows that scientific research is not a spiritless existence of data and isolation but rather a rich environment of comradery, growth, and discovery.

## 2 The Humor of Change

When Dr. Fred Tracy was born with poor eyesight and one hand, the doctor told his mother, “When God leaves something out, he adds something extra.” Dr. Tracy’s mathematical abilities are certainly that something extra.

While in graduate school at the University of Kentucky, Dr. Robert Whalin (also featured in this collection) interviewed Dr. Tracy and quickly recommended he be hired at WES despite someone suggesting he might not be a good fit due to his eyesight, which he had lost most of by this time. Full of emotion, Dr. Tracy recalls Dr. Whalin saying, “I’m not hiring him for his eyesight. I’m hiring him for his mind!” Dr. Tracy has proven his mind’s worth through the years with many accolades, including induction into the WES Gallery of Distinguished Civilian Employees in 2021 (Figure 2) and the Norman Medal from the American Society of Civil Engineers in 2022.

Figure 2. Dr. Tracy’s portrait for the US Army Waterways Experiment Station Gallery of Distinguished Civilian Employees.



Dr. Tracy saw many changes over the course of his time at ITL. When he was in school for preengineering at Murray State, one of the main jobs of

an engineer was to create specs and drawings by hand. He even had one professor tell him, “Fred, you cannot be an engineer because you can’t see.” Among his early jobs at WES was giving demos of the Calcomp drum plotter, one of the first computer graphics output devices, during an open house. Once, after showing this device off, a woman approached Dr. Tracy and said, “That thing is going to put my husband out of a job.” Now MATLAB, Octave, R, and other programs provide amazing graphics for engineers.

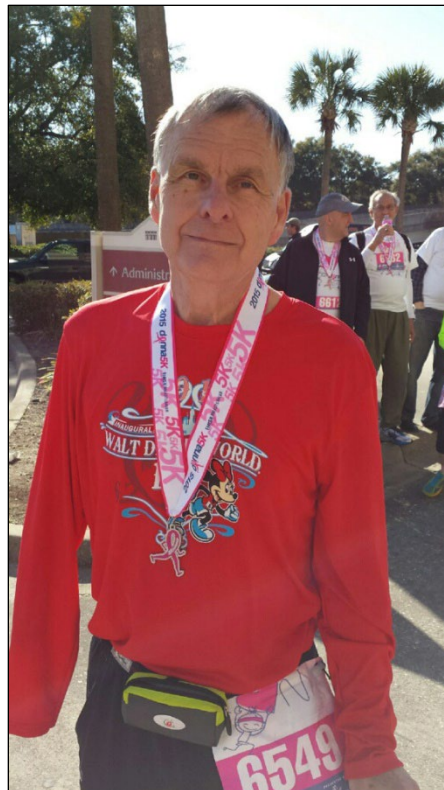
Another change was the growing need for security for the computer room. When Dr. Tracy first began working, the computer room had no security at all; you could just walk into the room. During that time, Dr. Tracy had an entire computer deck go missing, resulting in a full program having to be keypunched again. Luckily, he explains, they had about half a dozen keypunch personnel, and they were “pretty quick.” Later, as security increased, the doors to the computer room were locked. Users would submit their jobs in a bin, people inside the room would run the job, and the output along with the deck of cards would be placed in alphabetical bins, similar to a mail system. One day, a member of leadership was inspecting this security setup when a man came crawling out of one of the bins. Dr. Tracy recalls with a laugh, “He just didn’t feel like taking the door; he just wanted to crawl out.”

Dr. Tracy’s own life also changed drastically throughout his time at ITL. When he learned in graduate school that his eyesight was nearly gone, he dropped out; however, 20 years later, he still felt like he had unfinished business and signed up for the long-term training program. At the time, there was no remote option for school, and Dr. Tracy’s nearsightedness made it impossible for him to drive. He took Greyhound buses back and forth to Starkville, Mississippi, reflecting, “I must have wanted it pretty bad.” This desire to finish what he had started led Dr. Tracy to become the first PhD graduate from Mississippi State’s computational engineering program.

Following his time at Mississippi State, Dr. Tracy was thankful to return to a new ITL facility (currently Annex A, which was once the main building) that had been built in his absence. This meant his office was only a 0.7-mile walk from his home.

Plus, he took up running, motivated by Dr. Maureen Corcoran, who retired from the Geotechnical and Structures Laboratory (GSL). After Dr. Tracy told her, “I could never do that,” Dr. Corcoran convinced him to try. They started doing run/walk intervals and used this technique to do 5Ks, 10Ks, half-marathons, and one full marathon. The shirt Dr. Tracy is wearing in Figure 3 is from the Dopey Challenge at Disney World, which he and Dr. Corcoran completed in 2014. The event, held over the course of a long weekend, consists of a 5K on Thursday, a 10K on Friday, a half-marathon on Saturday, and a marathon on Sunday. “Thanks to Maureen, I barely finished the last race on Sunday!” Dr. Tracy says, adding that he’s “fresh out of cars” but has put plenty of money into running shoes.

**Figure 3. Dr. Tracy after the DONNA Marathon Weekend in Jacksonville, Florida. He ran a 5K on Saturday and a half-marathon the next day on his 70th birthday. (Photograph courtesy of Fred Tracy.)**



He shares this perspective: “You have two choices in life. You can appreciate what you’ve been given, or you can whine about not being able to drive.” If you know Dr. Tracy, you know what he chose.

### 3 Three Years Max

In 1978, in an attempt to use his civil engineering education more, Dr. Reed Mosher (ITL director from 2008 to 2018) applied for several positions through the Office of Personnel. Soon after, Dr. Radhakrishnan, who would go on to become the first director of ITL, hired him sight unseen to work at the Automated Data Processing Center. As visits to the lab were not funded at that time and the lab was about 1,800 miles away, Dr. Mosher moved his family to Vicksburg from the New York and New Jersey area without even visiting his new environs. Their apartment came unfurnished, and the truck carrying all of their household supplies was slow to arrive, so they ate out of camping dishes and slept in sleeping bags. Thankfully, new colleague Dr. Fred Tracy and his wife brought them a black-and-white TV so they at least had something to do. Dr. Mosher recalls, “I talked with my wife and told her we would be here 2 or 3 years max.” They are still here 45 years later, mostly because of the culture of ITL and the interesting challenges afforded.

Dr. Mosher had been at ITL for 16 years when Dr. Whalin called him into his office one Friday afternoon in 1994 to announce he was moving him over to the Structures Lab, which would become part of GSL in 2000, to be a division chief. However, in 2008, Dr. Mosher made his return to ITL, this time as the director (Figure 4).

Figure 4. Dr. Reed L. Mosher, director, ITL. (Photograph by Marie Darling.)



In its beginning stages, ITL was mostly operations and not really viewed as a research lab but instead a support lab. When former ERDC director Dr. Jim Houston called and encouraged Dr. Mosher to apply for ITL's director position, ACE-IT (in charge of enterprise-wide information management and information technology services) had recently been formed, and more than two-thirds of the lab had been moved there. Dr. Mosher says he "thought it would be kind of a challenge to try to build ITL into a research laboratory."

Early in his career, there was a need at WES for supercomputing, but that capability did not yet exist on-site. For example, the weapons effects group in the Structures Lab did a lot of ground shock modeling, and the Hydraulics Lab did a lot of numerical modeling. Dr. Mosher remembers people "going anywhere they could to get ahold of a supercomputer." He says they would usually go for a weekend and make a bunch of runs on the machines at NASA; Oak Ridge (Tennessee); Los Alamos (New Mexico); or Sandia (New Mexico). Of this time, Dr. Mosher also says they would "get back with boxes and boxes of paper, and you'd just have to go through and find out if it worked—go down and look for one number. 'Oh crap, that didn't work.'" They threw away a lot of paper from these runs. This laborious process was lightened when the lab's first supercomputer was installed around the time ITL moved into Annex A.

Dr. Mosher recalls the feeling of a close-knit environment, especially working in groups. For one project, Dr. Robert Hall, Mr. H. Wayne Jones, and he were assigned to create software for designing a retaining wall. The assignment had gone badly, and the group was putting in a large amount of overtime to get it to work. They (finally) reached the maximum amount of overtime allowed, after which, to their dismay, they were given an exception to allow them to continue working. At the end of an especially late night at work, Mr. Jones gave Dr. Mosher a ride home, and Dr. Hall was supposed to follow them to the gas station because they did not have much gas. Dr. Mosher says they turned right to go to the gas station; Dr. Hall, having already forgotten, turned left to go home. He adds, "About the Hawkins Street church, the car went 'cough, cough, unnn' and ran out of gas. We had to walk to Wayne's house late at night, get one of the other cars, and get some gas." During this same project, they were trying to get a demo to work that was giving them trouble. The group was using a computer system over in Macon, Georgia, that they believed shut down at midnight. One night, wanting to head home and rest before the next day, they

called to confirm that the facility closed at midnight. The man who answered the phone said, “Yeah, we close down at midnight . . . on Friday.” As it was not yet Friday, they ended up staying up all night trying to get the demo to work, went home, showered, and came right back to work.

During his time at ITL and ERDC, Dr. Mosher experienced comradery, opportunities to grow, and interesting and valuable projects. It is wonderful to see that this combination can make a person who is determined to stay for only “3 years max” stick around for more than 4 decades.

## 4 Hilarity in the Hallways

Dr. Jeffery Holland was recently selected as the director of the Thad Cochran Mississippi Center for Innovation and Technology, a facility in Vicksburg, Mississippi, whose mission is to create technology employment opportunities in the area. Additionally, he is active in the community and highly invested in creating opportunities for the city and the entire state of Mississippi. But this ERDC emeritus director spent most of his career working to achieve a different mission. In a previous life, Dr. Holland spent 5 years as the director of ITL from 2001 to 2006. Dr. Holland says of this time, “The 5 years I spent in this lab were the 5 best years of my entire career, bar none.”

When Dr. Holland was first named ITL director, it was still a young lab with many permanent positions not yet filled. The lab needed to fill roles such as technical director, division chief, and deputy director, so a joke emerged that revolved around a competition to see which applicants could complete their interviews the fastest. Dr. Deborah Dent and Ms. Alice Duke, already long-time employees at ITL, had the fastest interviews, both using roughly half of the 30 minutes they were allotted. Dr. Holland recalls they were both very nervous and just answered the questions quickly (and very well) and wanted to leave as soon as possible once it was over. Both were hired, and Dr. Dent was selected to be the ITL deputy director, a decision that had some interesting consequences for Dr. Holland.

Dr. Dent refused to let Dr. Holland’s 50th birthday go without acknowledgement, so with the help of Dr. Holland’s wife, Dr. Dent put on a party, gathering people from across the labs and even digging up some old photos from high school. Dr. Holland says that in one of the pictures, his hair was in an Afro “where it had finally grown out to what, as it turned out, was a maximum,” laughingly adding, “and this is a minimum,” in reference to his current hair. This was not the only time Dr. Dent went all out. One year for the Federal Combined Campaign, she convinced Dr. Holland that they should dress up as clowns, with red noses and headdresses. He thought the costume alone would be enough, but Dr. Dent had other ideas. On the day of the celebration, she showed up with scooters and told Dr. Holland they were going to ride them the length of the hallway between Annexes A and B. He says, “I started to protest, but it would not have done me a bit of good because, at that point, I’d delegated all the operations of the lab to her. I

didn't even know where the money was to turn the lights on." So, down the hall they rode on the scooters, dressed in full clown attire.

When not getting roped into shenanigans, Dr. Holland had a lab to run. He started holding staff meetings shortly after being selected as ITL director; there had been no staff meetings for about a year prior. At the second or third meeting, he told the group that they would be solving problems in the meeting. Dr. Holland gave the staff a problem and told them that they would make a decision about it at the next meeting so they would have plenty of time to think about it. The following staff meeting, when he asked questions about the assigned problem, only one person had anything to say. Nobody was used to talking in a group setting; they were used to going to the director's office and talking in private. Dr. Holland says he went back to his office, and there they were all lined up wanting to speak privately with him about the idea that had been presented in the meeting. He told them they were going to do the one idea because nobody had raised any objections. He says they objected then and told him that the idea was dumb and that he knew it, to which he responded that he did not know it was dumb because nobody said anything in the meeting. Dr. Holland remembers, "We didn't have any trouble getting people to speak up after that." They did eventually modify the original idea.

In 2009, Dr. Holland was selected as director of ERDC (Figure 5); however, his interesting days at ITL were not over. Dr. Holland remembers a small tornado coming through while he was at ITL meeting with a number of senior people. The tornado was skipping around outside and hit a small shack that had been set up for road construction, rolling it over. Fortunately no one was inside at the time. At this point, the air pressure in the building changed, creating a suction that caused an explosive sound. This caused the windows at the top of the long hallway to have air go through them for the first time in quite a while, blowing all the dirt that was up there into the hallway. The tornado then hit a transformer across Porter's Chapel Road, causing blue sparks to fly. Dr. Holland describes the main hall as somewhat like *Animal House* when Kevin Bacon is yelling for everyone to calm down, and they run straight over him. Moreover, he says the inquisitive nature of the ITL staff caused them to run out to the patio to watch the tornado. Dr. Mosher, the ITL director at the time, went to retrieve them, but they had left the door open, causing the floor in the break room to become wet. As Dr. Mosher was running, he hit the slick part and slid down the hall. A few people saw this happening and began screaming,

“The tornado is sucking Dr. Mosher out of the building!” When they were finally able to gather everyone in the hallway, the dust from the windows was everywhere, making hazy clouds. This caused a few people to again begin screaming, this time that the building was on fire. As Dr. Holland recalls this story, he says, “It was an exciting afternoon.”

Figure 5. Dr. Jeffery Holland, ERDC director.



Of his time at ITL, Dr. Holland tells us in parting, “I would have never left here if I had not felt conviction to become the director of ERDC. I would never have. It was fun.” While we may not currently see clowns on scooters riding down the hall or have tornadoes that, in people’s imaginations, cause the director to get sucked out of the building before it catches fire, ITL is still a fun place to work.

## 5 Fitting in a New Family

Dr. Deborah Dent started her full-time career at WES in 1976, working in the Automatic Data Processing center before the Information Technology Laboratory was conceived. As the computing infrastructure changed, Ms. Dent spent a great deal of time converting code from one platform to another. One of her supervisors, Mr. James Jefferson, wanted things done in a hurry, which required a lot of throughput from her.

Because Dr. Dent's work ethic was so high, one engineer, Dr. N. Radhakrishnan, or Dr. Radha, told her she was going to work for him because he did not understand computer science and how programming worked across different platforms and environments; Ms. Dent was actually the first person with a computer science degree hired at WES.

She, along with cohort Dr. Mike George, immediate supervisor Dr. Fred Tracy, and Dr. Reed Mosher, the future director of ITL, helped start the initial workforce of what would become ITL. From there, she went on to pursue her PhD and, shortly after attaining it, was named deputy director of the lab.

As busy as she was supporting tasks and leading programs, what was central to Dr. Dent was fitting in with a good crowd of people. Describing herself as a bit different from others, she laments that her mother did not initially support her majoring in computer science and told her, "You better find a minor in something you might get a job in because I don't know if you're gonna get a job in this computer science."

Initially working to support the system side of ITL, she jokingly describes the employees and culture as "wild and crazy." But then, remembering her move over to the engineering side of ITL, she muses on seeing a man sitting in a dark room, his face connected to a computer. Busy as he was, at some point, this man started jumping up and hitting the monitor. That man was Mr. Robert Walker, who would eventually become the ERDC deputy chief information officer. Soon after, Dr. George also started hollering; everyone was acting like they were in their own world and just behaving without regard to anything else.

And that was when Dr. Dent knew: "I'm home. I found myself."

Here, she did not feel weird. She fit right in with this cadre of people who played intense jokes on one another. Once, they took all of Mr. Walker's stuff, moved one of the ceiling tiles, and put everything up there; she says he was "going crazy" trying to find everything.

They were not just silly with each other, though. They were often quite sweet. They had a new lead, Dr. Jeff Holland, who apparently was always "so serious" that he had never had a work birthday party before. They immediately set out to fix that, working with his wife and putting up monitors to show baby pictures for his 50th birthday. She likes to say they broke the seriousness out of that man.

Despite Dr. Dent fitting in, she was not always allowed to participate. There was apparently an "old boys club" where men would go up to a hill, roast a pig, and smoke cigars. "No women allowed." Times were different then. But Dr. Dent, not wanting to let her team-building momentum stall, decided to "bust up in there one day." Despite that effort, she laments that she was, unfortunately, never able to break down that wall. Nevertheless, she continued to build relationships, including with ITL's future director Dr. David Horner, who at the time was still working at GSL.

When Dr. Reed Mosher became the ITL lab director, he was struggling to understand some of his employees. But somehow, Dr. Dent always seemed to know what everyone was up to and who to reach out to for any reason. Her knowledge was apparently a mystery to Dr. Mosher, but he eventually noticed that the first thing she did each morning was walk around the halls to talk with everyone. At the time, ITL was a small enough laboratory that she could talk with everyone, and she had emphasized to Dr. Mosher that he needed to do the same. One day, Dr. Mosher put it to the test and started following her as she was "making her rounds." The next thing Dr. Dent knew, Dr. Mosher had taken over her little gift of knowing things about people. "People stopped telling me stuff because they got a chance to tell the director himself," she reminisces. However, she was not hurt by that. Dr. Mosher got a chance to open up and better fit in with his own laboratory. And that circles back to Dr. Dent's own feelings regarding fitting in. It was what she wanted, and it was what she got.

The chance to fit in is perhaps one of ITL's best characteristics. This unique place to work has something for anyone with the will to get up and

go find it as Dr. Dent did. Dr. Dent found a new family at ITL, and she implores everyone to take advantage of their new home at ITL because “it is such an awesome opportunity.”

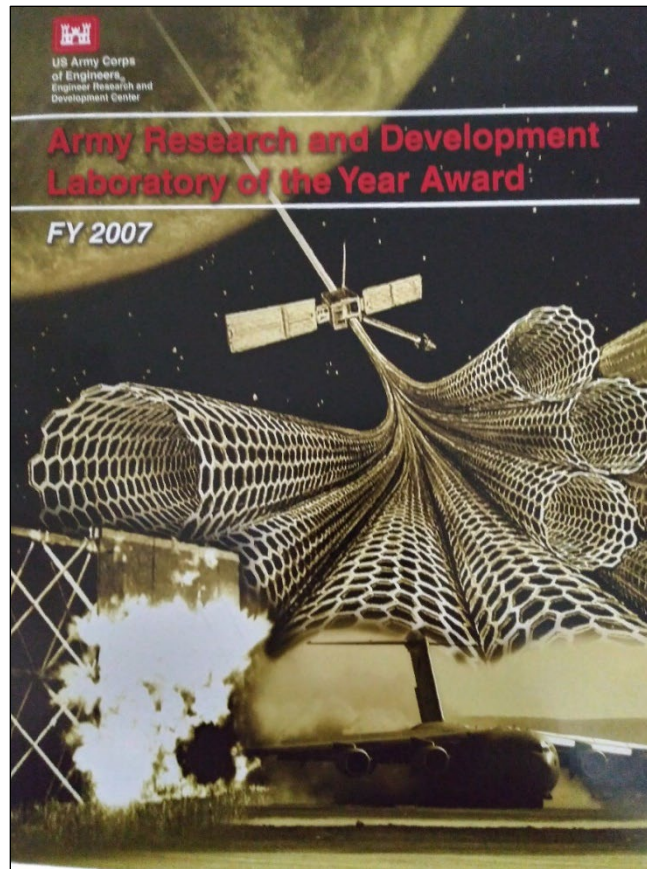
## 6 From Passion to Patent

Being an extraordinary researcher requires a combination of several factors, including natural talent, perseverance, creativity, collaboration, and good timing. In addition, passion, a strong work ethic, effective communication skills, and dedication to continuous learning and improvement play a vital role. A researcher of such caliber can bring a wide range of benefits to an organization, including mentorship, research excellence, increased funding opportunities, collaboration opportunities, and enhanced reputation.

Dr. Bob Welch is one of these elite researchers. He had an exemplary career in the fields of physics and engineering, and his experience is vast, with years working for both the US Navy and the US Army Corps of Engineers (USACE). Dr. Welch has held various positions throughout his career, including research physicist, supervisor, center director, program manager, and special assistant to the director. Further, his passion and perseverance resulted in many awards, including a US Presidential Letter of Commendation from President Jimmy Carter in 1979, Researcher of the Year from USACE in 2009, and an ERDC Award for Outstanding Team Effort as Team Leader in 2009. Additionally, he has authored over a hundred publications and has been awarded eight US patents.

Dr. Welch devoted the last part of his career to the study of advanced carbon nanotube-based materials. In fact, he was so passionate about his work that his children began placing bets on how long it would take him to start talking about carbon nanotubes in any given situation. One year for Christmas, his youngest daughter even gave him a T-shirt with images of carbon nanotubes. The research was significant enough that, in 2008, ERDC won the Army lab-of-the-year award with a submittal that highlighted the work of Dr. Welch's team and referenced the research field in the illustration on the cover (Figure 6).

Figure 6. The cover of the FY 2007 Army Research and Development Laboratory of the Year Award featuring Dr. Welch's team's work.



The team's pioneering research faced some challenges from the research review committee. Questions arose from the review committee regarding the cost of carbon nanotubes, which was \$145/gm at the time versus \$100/yd<sup>3</sup> for concrete, begging the question as to whether carbon nanotubes would ever be cost effective and feasible at industrial production levels. However, Dr. Welch was passionate about the team's work and successfully defended the research by pointing out that in 1855, aluminum was so expensive it was worth more than platinum and, in fact, was used as the capstone for the Washington Monument because of its value. Dr. Welch argued that aluminum, like carbon, is an abundant material on Earth. Aluminum's earlier huge costs reflected a production problem, which was solved. He suggested that carbon nanotube production methods would likewise improve and lead to a similar reduction in costs. Following this defense, his team was able to successfully carry out the research and exceeded expectations, even though at the start of the research no one in

ITL had a background in molecular dynamics, which was a key component of the research.

Despite his single-minded focus on his research, Dr. Welch was also known for his sense of humor and willingness to let loose and have fun. One such example involved participating in an office chair race with Mr. Dave Richards, a technical director at that time, to raise money for the Combined Federal Campaign (CFC) (Figures 7 and 8). The race was held in the long hallway that connects Annexes A and B at ITL. Mr. Richards and Dr. Welch had a long-term friendly rivalry, and as the chair race took off, Dr. Welch was in the lead. To compensate, Mr. Richards hung on to the back of Dr. Welch's chair, making it impossible for Dr. Welch to pull farther ahead. As they neared the finish, Mr. Richards swung Dr. Welch's chair behind his, thus winning the race. At another ITL CFC charity event, Dr. Welch dressed up like Garth Brooks and lip-synced "Friends in Low Places" to the delight of his teammates, who talked about it for years. Dr. Welch's Garth Brooks performance was a fun departure from his usual demeanor as a serious researcher.

Figure 7. Dr. Bob Welch (*left*) and Mr. Dave Richards (*right*) prepare for their chair race. (Photograph courtesy of Robert Welch.)



Figure 8. The crowd cheers as the contestants take their marks. (Photograph courtesy of Robert Welch.)



Dr. Welch and his exceptional research are valuable assets to ITL and to ERDC as a whole. His abilities to initiate research, collaborate with different labs both within and outside ERDC, and file patents for his research set a good example for others. Dr. Welch understands the value of collaboration and knows that sharing knowledge and expertise can lead to new discoveries and advancements in the field. Further, the passion, expertise, and dedication of Dr. Welch and others like him (along with a willingness to have some fun) can inspire others and create a positive work culture.

Dr. Welch has eight patents, which represent a significant portion of the total held by ERDC. This is a testament to his innovative thinking and dedication to his work. Researchers like Dr. Welch inspire young scientists and engineers to pursue their passions and meaningfully contribute to their respective fields.

## 7 Data and Dinosaurs

Information and computer power are now at our fingertips, but when Dr. Louis Turcotte received his master's degree from Mississippi State University in 1981, using a supercomputer was a much more complicated exercise. Few institutions had their own supercomputers, so when researchers wanted to use one to assist processing their data, they had to lease computer time from a company and then travel to that site.

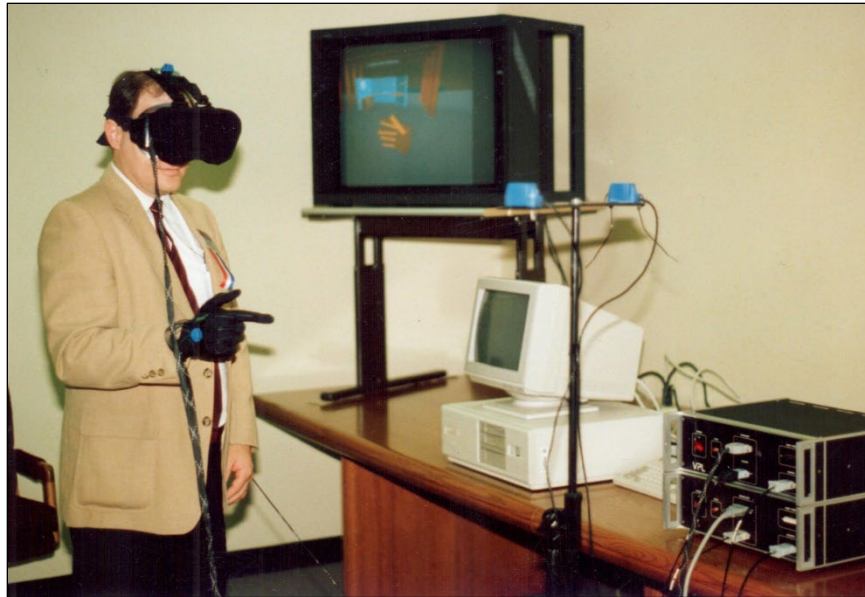
This concept may seem prehistoric to us today with remote access to supercomputers across the country and our own personal supercomputers within ITL itself. But around 1990, when Dr. Turcotte took a job in Vicksburg at ITL, this necessity was commonplace. He says, "Typically, we used to buy our time on the weekends from these other federal agencies, mostly the Department of Energy, who had supercomputers in those days, or some of the commercial ones, we would buy our time on the weekends when it was the cheapest and the least number of people were trying to get access to it. And you typically spent the weekend and flew out on Friday and flew back on Monday and spent all weekend there doing computing. That was just the way business was done back then. If you wanted to address a certain class of engineering problem or science problem, that's kind of how it was in those days."

These trips led to comradery and collegial ribbing. Dr. Turcotte remembers one trip to a supercomputing forum with Dr. Fred Tracy and a couple other newer WES researchers. "Fred has visual and physical limitations but most likely has a genius IQ. When we were on this particular trip, we went out to eat one night, and there was a pool table at the location. We had somebody from another one of the labs with us, and he bragged about how good of a pool player he was, so I said, 'Nah, I don't believe you. I bet you can't even beat Fred.' And so he took me up on that, and it turns out that Fred was a very masterful pool player. The lesson was never make assumptions about someone's capabilities!"

All this travel for computing was expensive, so eventually ITL justified procuring its own supercomputer. While supercomputers solve complex problems, one of the difficulties with the enormous quantities of data that supercomputers process is understanding these huge datasets. To address this, Dr. Turcotte helped establish ITL's Scientific Visualization Center,

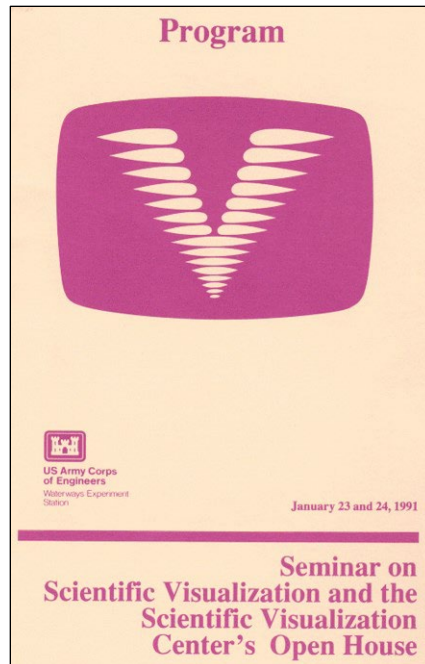
which later became the Data Assessment and Analysis Center, or DAAC (Figure 9).

Figure 9. Dr. Turcotte wearing a VPL Research VR headset. (Photograph courtesy of Louis Turcotte.)



After amassing some success, the Scientific Visualization Center team decided to host a grand opening in 1991 to showcase their capabilities, highlight some other industry advancements, and bring in distinguished individuals to give talks (Figure 10). Texas Instruments (TI) was one such industry participant, shipping to ITL a three-dimensional display device for the showcase prior to the open house. As Dr. Turcotte recalls, “When the eighteen-wheel truck arrived at ITL they had to unload the other freight on the truck prior to unloading TI’s equipment. The only place to unload in those days was at the south end of the original ITL building.” The shippers said it would take a while to unload everything as the TI delivery was in the very back of the trailer, so Dr. Turcotte and his team left for lunch. “When we came back, we were driving up to the parking lot and there were these dinosaurs sitting out in the parking lot, as pretty as they could be, real big.” The shippers had had to unload all of the dinosaurs they were hauling, likely to a museum, before they could get to the TI delivery. “We always used to joke about the dinosaurs in the parking lot,” Dr. Turcotte chuckles.

Figure 10. The program from the seminar on Scientific Visualization and Scientific Visualization Center's open house.



Research and progress often lead to unlikely situations and experiences. Certainly, one never expects to encounter dinosaurs in the parking lot. Yet combining these shared experiences with passion and enthusiasm strengthens teams. “The people were the priority part for me,” Dr. Turcotte shares. “Very early on when we started this high-performance-computing program, it was the destination for the very, very best employees in ITL. In those days, everybody wanted to work in the supercomputing field. We were able to import the best employees from around the lab to become part of our program. One of the things that has been nice about this program is that you’re generally dealing with very technically capable, very technically passionate people with high work ethics, all those combinations, very creative. It’s been the people that I’ve enjoyed working with and the interactions.”

## 8 Growing Together

In a research organization, the mentor-mentee relationship can be a crucial factor in shaping the career growth and success of researchers. The relationship is often symbiotic. Mentors can help mentees navigate the complex research landscape by sharing their experiences, knowledge, and expertise. In turn, mentees can bring new ideas, perspectives, and approaches to the mentor's research program. They can also help mentors stay up to date on the latest research developments and technologies. This transfer of knowledge and skills is especially important in a research organization.

Ms. Patti Duett's career at ITL is a prime example of how a mentor-mentee relationship can extend beyond just one leader and continue to influence an individual's career growth and success. She says, "I worked with four directors; each one had a different leadership style. Each one of them added more to the lab and kept taking the lab to the next level." Mentorship from multiple leaders exposed her to different leadership styles and interests, allowing her to develop a broader perspective and skill set. This helped her become more adaptable and versatile in her career, as she could apply the lessons and skills learned from each mentor to her work.

She began her career as a software developer and worked her way up to become the deputy director of ITL. She was able to transition between different roles and projects throughout her career, always seeking to learn something new and improve her skills. Ms. Duett observed the changing role of researchers and the need for researchers to not only to be experienced in their field but also to have a better understanding of the entire process, from funding to project completion. Ms. Duett shares, "It's good that the researcher understands the entire process from cradle to grave. It's good to understand the kind of money involved in the research, where it comes from, how it comes in, how to handle it, how to put together a team, deal with contracts, et cetera." This process requires good management, collaboration, and communication between different stakeholders in a research project. Ms. Duett excelled in this area.

One of her major focuses was the importance of having fun and building relationships, fostering a positive work culture. She says, "My philosophy in life is to work hard and play hard. I believe in laughing and cutting up and having fun at work." Work can be challenging and demanding, but

taking the time to build relationships and enjoy the company of colleagues can help to create a supportive and fulfilling work environment.

However, skills and relationships were not the only thing Ms. Duett focused on building. A lot of dedication and hard work went into making the Supercomputing Research Center and the Secure Computing Facility a reality (Figure 11). She adds, “Constructing a new government building can be a time-consuming process that necessitates careful planning, design, and execution. You have to figure out how to get the funding, and then you have to be persistent in getting the funding. Anything you do with the government also requires a lot of paperwork and an approval process.” The collaboration and persistence of the team, along with the involvement of various stakeholders, showcases the importance of teamwork and communication in achieving complex goals. The use of different funding sources also demonstrates the importance of proper financial management and accountability in large projects. She observes, “ITL has grown from being a small building to a world-class research facility. It really helps with recruiting and bringing new talent so they can collaborate and work together.”

**Figure 11.** Officials from the Engineer Research and Development Center cut the ribbon for two new Supercomputing Research Center facilities at the Information Technology Laboratory in Vicksburg, Mississippi, on January 20, 2021. Ms. Duett is in pink.  
(Photograph by Khary Ratliff.)



A highlight of Ms. Duett's career was when she got involved with the Extreme Ownership program with Drs. Horner and Lynch. She says, "It really made a difference in my life." Even though it was late in her career, she learned a lot from that program. She believes it made her a better person, not only at work but also outside of work. Another thing Ms. Duett loves about ITL is the people. During her time here, she observed ITL grow from a support lab to a premier research lab under different leaders and the legacies their different leadership styles left. Her dedication to personal and professional growth, as well as her commitment to making a positive impact, contributed to the success of the laboratory and the people she worked with.

## 9 Why Relationships Matter

Dr. Robert Whalin began his professional career studying physics at the University of Kentucky. At the time, “If you majored in physics, you could do anything,” he remarks. He picked up a graduate degree and started doing research in explosion-generated waterways. He was doing pretty well with his career and was starting a new family when he found himself in Vicksburg at WES.

After Dr. Whalin completed his PhD in oceanography, choosing that program because he “was a wave guy,” he began a new role as Wave Dynamics division chief at WES. While visiting Fort Belvoir, Virginia, around that same time, he recalls being accused of moving the Coastal Engineering Research Center from Fort Belvoir to Vicksburg and combining it with the Hydraulics Laboratory to form the Coastal and Hydraulics Laboratory.

Dr. Whalin became the technical director of WES and a member of the Senior Executive Service, or SES, in June 1985. At the time, he reported to the colonel tasked to oversee WES; but in 1988, the Department of the Army flipped that so that the colonel reported to him. This was because SESs were supposed to be equivalent to one-star generals and thus should not report to a colonel.

At the same time, the Army was addressing trouble with skyrocketing purchasing and organizational challenges. USACE was also facing similar quandaries. Thus, an assessment of all facilities and a proper chain of command needed to be established, which included the new research center that was soon to become the Information Technology Laboratory. All of these events served to build a strong relationship between Dr. Whalin and the colonel at the time. That relationship prompted the colonel to ask Dr. Whalin what he thought about all the reorganization going on. Dr. Whalin asked simply, “Can we get out of this?” The colonel proposed ways to do just that, but the chief of USACE was not on board as the Army chief of staff had been promised that reorganization would happen. The colonel then had a novel idea: “Let’s call it [the new research center] a ‘laboratory.’”

Forming a major organization requires sending a request to USACE Headquarters, where the chief makes an official decision and the deputy chief “does the stamping.” Dr. Whalin was pretty sure everyone was going to

say, “No!” And sure enough, nearly 100% of the approving staff at headquarters disapproved the formation of the lab—even the research and development director. Despite this, it came out of the chief’s office as approved. Why was the organization ultimately approved despite every single person recommending disapproval? Because relationships matter.

The chief of engineers and deputy commander had been at the Massachusetts Institute of Technology doing graduate work at the same time as the new colonel for WES. As it turns out, all three were “big buddies,” and the chief was the one who had earlier selected Dr. Whalin to be the technical director. And just like that, because of these relationships, the Information Technology Laboratory was approved on paper. Despite USACE not originally wanting to form ITL, the Department of the Army was perfectly fine with it.

While the formation of ITL was being finalized, simultaneously, there was a need for automatic data processing equipment to be purchased, and WES was also competing to potentially acquire and host several supercomputers. The under secretary of the Army had gone to Kirkland Air Force Base, seen their supercomputing facility, and came back asking, “How many supercomputers do we have in the Army?” At the time, there were none. According to Dr. Whalin, the under secretary responded, “Well, what’s wrong? Don’t we have enough problems? Enough complicated problems that need supercomputers? Is our stuff just too simple?” Clearly there was a need to acquire and manage supercomputers.

Dr. Whalin eventually heard about this because WES was trying to compete with other organizations to procure supercomputers but was not getting anywhere. WES was apparently sending GS-13s to the meetings while other organizations were sending generals, GS-15s, and SESs.

Dr. Whalin decided “to go to every single meeting, no exceptions,” and that is exactly what he did. Originally, seven candidate labs and organizations made a list for hosting supercomputers; and WES, Dr. Whalin jokes, was ninth on that list, showing just how out of the running WES was. But once Dr. Whalin was involved, they ended up number three behind the Ballistics Research Laboratory (soon to become the Army Research Laboratory) in the number one position and the US Army Tank Automotive Research Development Engineering Center (TARDEC) at number two.

WES rose from “nine” to three during one fateful meeting with the deputy undersecretary of the Army for operations research. The undersecretary knew his way around the automatic data processing equipment and computations, and Dr. Whalin coincidentally ended up in his office several times. It turned out that the WES colonel was also good friends with this deputy because of shared studies in operations research, and a scheme was made. During this meeting, the attendees were asked how many supercomputers were needed and how soon the laboratories needed them. Dr. Whalin’s turn to respond came last. Representatives from the other labs were saying they wanted “a few” or “several,” but Dr. Whalin said WES needed only one for the first year and would request another only if the first one became full before the end of the year. He told them, “I would hypothesize that the real need ought to be determined by how much supercomputer time each office is procuring from someone else,” such as Kirkland Air Force Base or Boeing. WES was spending approximately 2 million dollars per year on supercomputing time. “And I knew damn good and well nobody else was buying any.” It turns out, he was correct, and Dr. Whalin even had a copy of the bill.

As the Army budget was being finalized, a senator passed on the info that the supercomputers up for grabs were actually going to go to the University of West Virginia. So how did ITL end up with them? Apparently, the change was because the official name of the ITL building was the Jamie L. Whitten Building. Whitten was chairman of the House Appropriations Committee, and at the last minute he wrote into the budget that the supercomputers would actually go to WES—all because of some scheming by people in an office and pulling the strings of their relationships, Dr. Whalin chuckles.

While relationships are indeed the key to making things happen, when asked what the best reason to work at ERDC is, Dr. Whalin says, “The program sends people to school.” Indeed, ERDC has a long-standing history of promoting continuing and advanced education; and Dr. Whalin comments that at the time of his employment, no other organization was doing it.

As Dr. Whalin’s recollections show, connections and relationships, often resulting from this continued education, can make a fundamental difference in the outcome of a story.

## 10 Fighting the Good Fight

After working at the Environmental Laboratory for a few years as a mathematician, Ms. Alice Duke (Figure 12) moved to the Automatic Data Processing (ADP) Coordinators Office in 1985. As this group was new, the other labs viewed it with skepticism; change is rarely easy. Ms. Duke's job was to approve ADP equipment and communications purchases. Her particular element was consolidated into the Information Management Division when ITL was formed. Across WES, there was no common infrastructure for these types of purchases; each lab did things its own way. Therefore, Ms. Duke made the first attempt to consolidate and develop a common backbone. From the researcher's standpoint, they questioned ADP's purpose—ITL researchers were already using various equipment and had their own computers and mainframes, so what was ADP's business being here?

Figure 12. Ms. Alice Duke. (Photograph by Marie Darling.)



Slowly but surely, ITL built this research component, consolidating the division to support all of WES. Ms. Duke's role in this was to plan, working with the other labs on a communication front so they could all have a common base. ADP continued supporting all of WES until ERDC formed, a milestone Ms. Duke remembers well since she planned the open house.

Before ERDC, each site had its own IT department; but now with all labs under ERDC, she consolidated the IT management functions for the four

sites into a single division spread across Champaign, Illinois; Hanover, New Hampshire; Alexandria, Virginia; and Vicksburg, Mississippi. This change caused people to be unsure of their role. They had to define new positions and establish common policies and websites. There were quarterly visits to each site to let people know they had support. Virtual private cloud (VPC) became the way to do business because everything was now at four sites. Information management functions included visual production, information assurance, PC and PC LAN support, communications, and data management. This multisite support changed the way ITL did business. To capture its new scope, the division changed its name from the Information Management Division to the Infostructure and Knowledge Management Division.

Another milestone was the challenging A76 study, a USACE-wide initiative to contract out IT services. It affected 100 people across all four sites as it aimed to identify positions to contract out. Though their jobs did change, they did not lose their employment. Ms. Duke explains, “Everyone’s position was up for grabs. However, because of Dr. Holland, who was director of ITL at the time, not one government person lost their job, even though all their jobs were on the chopping block.” Dr. Holland led the team that created the combined government and contractor bid that won, and everyone was able to be placed somewhere. Ms. Duke feels this gave ITL a focus on research that it did not previously have. While ITL always fought to be a research lab, despite it being unclear to others what that research was, the A76 allowed ITL to distinguish exactly what research it did.

With ITL spread across multiple sites, Ms. Duke’s biggest surprise was the moment all of those sites began to feel like they were equal parts of ITL, “to finally feel like you know the people in Hanover like you know the guy in the office down the hall,” she elaborates. Part of this success was getting the VPC to work correctly consistently and really being able to hold meetings and communicate without constant worry.

Resulting in a laughable experience, though it was not funny in the moment, Ms. Duke went to Hanover on a TDY. There, they stayed at a bed and breakfast. The weather got down to freezing in October; half the home lost heat, though she initially thought the issue was just her room. There was no one at the front desk, so she turned on the gas heater and pulled all of the blankets out of the closet to stay warm. When she later went out in

the hallway, she discovered that others were frozen too and trying to figure out how to get in touch with someone to come fix the heat.

Ms. Duke's responsibilities occasionally extended outside of the usual. When ITL expanded into the new ITL building, Ms. Duke and two others were put in charge of finding furniture for it, everything from trashcans to outdoor benches to chairs. Ms. Duke picked desk chairs for everyone. Most of the staff were bigger men, but Ms. Duke was only 100 lb. She found one she felt comfortable in, but her boss at the time could not get into the chair. He told her that the only person that could fit in this chair was her, and the situation opened her eyes to picking out furniture. She now always thinks to herself, "Just because you like it doesn't mean someone 6 ft tall is going to like it."

Her favorite part about working in ITL was the people. They had Christmas dinners down the hallway and people played music. There was a lot of comradery. Everyone wanted others to do their best and looked out for each other. She feels ITL has come a long way from its bumpy start, finally finding its niche. And it is the people who made that happen.

## **11 Conclusion**

The document serves as both a tribute to the lab's achievements and a wellspring of inspiration for aspiring leaders, showcasing the profound impact of not only dedication and teamwork but also fun. By celebrating these stories, we invite others to share in the collective admiration we felt while compiling this document.

We hope that subsequent efforts will continue to record these types of stories at ITL and across ERDC, providing future generations insight into the unwavering commitment of the pioneers who established ITL's and ERDC's esteemed legacy.

## Abbreviations

|        |  |
|--------|--|
| ADP    | Automatic Data Processing  |
| CFC    | Combined Federal Campaign  |
| DAAC   | Data Assessment and Analysis Center                              |
| ERDC   | Engineer Research and Development Center                         |
| GSL    | Geotechnical and Structures Laboratory                           |
| ITL    | Information Technology Laboratory                                |
| LDP2   | Leadership Development Program 2                                 |
| SES    | Senior Executive Serviceman                                      |
| TARDEC | US Army Tank Automotive Research Development Engineering Center. |
| TI     | Texas Instruments  |
| USACE  | US Army Corps of Engineers                                       |
| VPC    | Virtual private cloud  |
| WES    | US Army Waterways Experiment Station                             |

# REPORT DOCUMENTATION PAGE

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| <b>14. ABSTRACT</b><br>The 2022–2023 Leadership Development Program 2 (LDP2) team from the Information Technology Laboratory (ITL) created this document to explore the human side of ITL’s history through the viewpoints of former influential figures at the lab. These individuals played a crucial role in elevating the lab to its current prominent position. The dynamic nature of the document allows continuous addition of such stories, providing future generations with insight into the unwavering commitment of the pioneers who established ITL’s esteemed legacy. Each narrative sheds light on different aspects of the lab, including its people, diversity, and excellence. The document serves as both a tribute to the lab’s achievements and a wellspring of inspiration for aspiring leaders, showcasing the profound impact of dedication and teamwork. By celebrating these stories, we are able to learn from those who came before us and cultivate an enhanced vision for the future. |                                    |                                       |   |   |                         |
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